DOE/ID-10635
Revision 0
June 1998

Field Sampling Plan for Test Area North TSF-09, TSF-18, and TSF-26 Area Soils

Idaho National Engineering Laboratory

U.S. Department of Energy • Idaho Operations Office

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Published June 1998

Prepared for the
U.S. Department of Energy
Idaho Operations Office

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6-17-98
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ABSTRACT

This Field Sampling Plan, prepared for the Department of Energy in accordance with the Federal Facility Agreement and Consent Order, describes the field sampling activities that will be performed, and the Quality Assurance Project Plan details, processes, and programs that will be used to ensure that the data generated are suitable for their intended uses. The purpose of this Plan is to guide the collection and analysis of soil samples from various Waste Area Group 1 sites located at Test Area North Technical Support Facility areas (TSF-09, TSF-18, and TSF-26) on the Idaho National Engineering and Environmental Laboratory.

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ACRONYMS

μg/L	microgram per liter
AEC	Atomic Energy Commission
Al	aluminum
Am	americium
ANP	Aircraft Nuclear Propulsion Program
ARDC	Administrative Records and Document Control
bgs	below ground surface
Ca	calcium
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
Co	cobalt
COC	chain-of-custody
cpm	counts per minute
Cr	chromium
Cs	cesium
DOE	Department of Energy
DOE-ID	Department of Energy – Idaho Operations
DQO	Data Quality Objective
EPA	Environmental Protection Agency
ER	environmental restoration
ERIS	Environmental Restoration Information System
ERO	Emergency Response Organization
Eu	europium
Fe	iron
FFA/CO	Federal Facility Agreement and Consent Order

FSP	Field Sampling Plan
FTL	field team leader
HASP	Health and Safety Plan
HSO	health and safety officer
ICP/AES	Inductively Coupled Plasma Atomic Emission Spectroscopy
ID	identification
IDHW	Idaho Department of Health and Welfare
IDW	investigation derived waste
IET	Initial Engine Test Facility
IH	industrial hygienist
INEEL	Idaho National Engineering and Environmental Laboratory
ISV	In-Situ Vitrification
K	potassium
LMITCO	Lockheed Martin Idaho Technologies Company
LOFT	Loss-of-Fluid Test Facility
MCP	management control procedure
Mg	magnesium
mg/kg	milligram per kilogram
Mn	manganese
Na	sodium
OSHA	Occupational Safety and Health Administration
OU	operable unit
P	phosphorus
PCB	polychlorinated biphenyl
pCi/g	pico-Curie per gram

PPE	personal protective equipment
ppm	parts per million
QA/QC	quality assurance/quality control
QAPjP	Quality Assurance Project Plan
QC	Quality Control
Ra	radium
RBC	risk-based concentration
RCRA	Resource Conservation and Recovery Act
RCT	radiological control technician
SAP	Sampling and Analysis Plan
Si	silicon
SMO	Sample Management Office
SOP	standard operating procedure
SOW	Statement of Work
Sr	strontium
SVOC	semi-volatile organic compound
TAA	temporary accumulation area
TAN	Test Area North
TCLP	toxicity characteristic leaching procedure
Ti	titanium
TMI	Three-Mile Island
TPR	technical procedure
TRA	Test Reactor Area
TSCA	Toxic Substances Control Act
TSF	Technical Support Facility

U	uranium
UST	underground storage tank
VOC	volatile organic compound
WAG	waste area group

Field Sampling Plan for Test Area North TSF-09, TSF-18, and TSF-26 Area Soils

1. INTRODUCTION

In accordance with the Federal Facility Agreement and Consent Order (FFA/CO), the U.S. Department of Energy (DOE) submits the following Field Sampling Plan (FSP) for area soils at the Test Area North (TAN) Technical Support Facility (TSF) TSF-09, TSF-18, and TSF-26 on the Idaho National Engineering and Environmental Laboratory (INEEL). This FSP is identified as one part of a two part Sampling and Analysis Plan (SAP) identified as a secondary document under the FFA/CO. The second part of the SAP is the Quality Assurance Project Plan (QAPjP). The governing QAPjP for this sampling effort will be the *Quality Assurance Project Plan for Waste Area Groups 1, 2, 3, 4, 5, 6, 7, 10, and Inactive Sites* (Lockheed Martin Idaho Technologies Company [LMITCO] 1997a). This document is incorporated herein by reference.

These plans have been prepared pursuant to the *National Oil and Hazardous Substances Contingency Plan,* (Environmental Protection Agency [EPA] 1990), and guidance from the EPA on the preparation of SAPs. This FSP describes the field sampling activities that will be performed, and the QAPjP details, processes, and programs that will be used to ensure that the data generated are suitable for their intended uses.

1.1 Field Sampling Plan

The purpose of this FSP is to guide the collection and analysis of soil samples from various WAG 1 sites including TSF-09, TSF-18, and TSF-26. The objectives of the sampling for each of these WAG 1 sites are as follows:

- Provide specific volatile organic compound (VOC) data for identified contaminants of concern, to be used as the basis to support a no-longer-contained-in determination
- Provide specific polychlorinated biphenyl compound (PCB) data for identified contaminants of concern, to be used to further support as found concentrations of PCBs in the soils
- Provide specific TCLP metals data to be used to support the statement that the soils do not contain TCLP metals at levels regulated under RCRA.
- Provide whole rock analyses from the TSF-09 and TSF-18 area to provide engineering data to support the possible in situ vitrification (ISV) of these tank sites.

1.2 Project Organization and Responsibility

The organizational structure for this work reflects the resources and expertise required to perform the work, while minimizing the risks to worker health and safety. Job titles of the individuals who will be filling key roles at the work site, and lines of responsibility and communication are shown on the chart in Figure 1. The following sections outline responsibilities of key personnel.

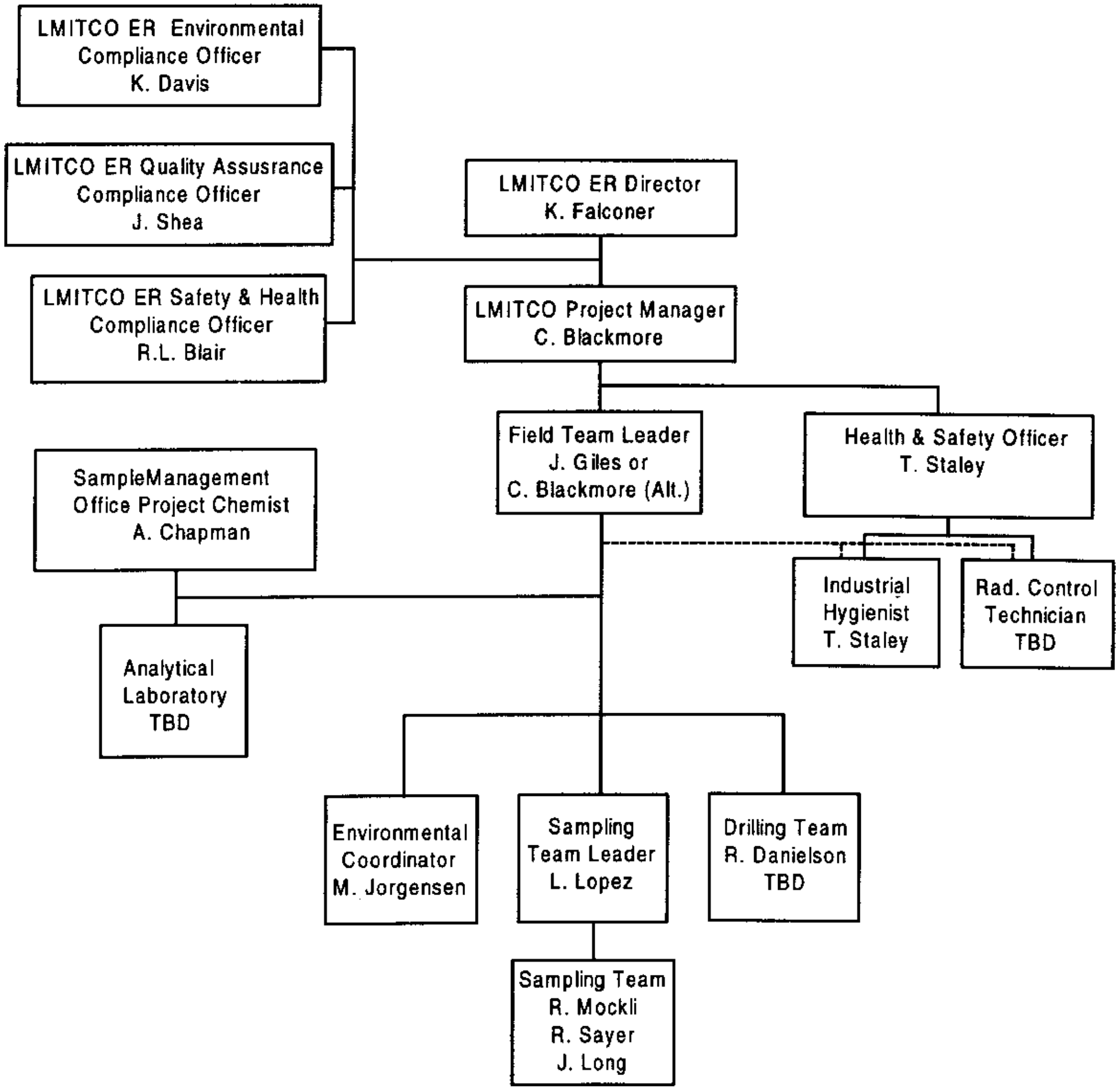


Figure 1. Organization chart.

1.2.1 Environmental Restoration Director

The LMITCO Environmental Restoration (ER) Director has ultimate responsibility for all project technical quality, and personnel safety during field activities performed by or for the ER program.

The ER Director provides technical coordination and interfaces with the Department of Energy Idaho Operations Office (DOE-ID) Environmental Support Office. The ER director ensures that:

- All activities are conducted in accordance with the Occupational Safety and Health Act (OSHA), DOE, EPA and State of Idaho Department of Health and Welfare (IDHW) requirements and agreements

- Program budgets and schedules are monitored and approved

- Necessary personnel, equipment, subcontractors, and services are available

- Direction is provided for the development of tasks, evaluation of findings, development of conclusions and recommendations, and production of reports.

1.2.2 ER Environmental, Safety, and Health Compliance Officers

The ER Environmental, Safety, and Health (ER ES&H) Compliance Officers are responsible for ensuring that ES&H oversight is provided for all ER programs and projects. These positions report, and are accountable to the ER Director. The ER ES&H Compliance Officers perform line management reviews, inspections, and oversight activities in compliance with Management Control Procedure, MCP-2727, "Performing Safety Reviews" (LMITCO 1998a). Project or program management shall bring all ES&H concerns, questions, comments, and disputes to the ER ES&H Compliance Officers that cannot be resolved by the Health and Safety Officer (HSO) or one of the assigned ES&H professionals.

1.2.3 ER Quality Assurance Compliance Officer

The ER Quality Assurance (QA) Compliance Officer provides guidance on task site quality issues. The ER QA Compliance Officer observes task site activities and verifies that the task site operations comply with quality requirements pertaining to these activities. The ER QA Compliance Officer identifies activities that do not comply or have the potential for not complying with quality requirements, and suggests corrective actions.

1.2.4 Project Manager

The LMITCO project manager has the responsibility to oversee all administrative activities conducted during the project, including notifying the facility representative of all work activities. Ultimate responsibility for the management of waste generated as a result of this project's activities lies with the LMITCO project manager. The LMITCO project manager is responsible for ensuring that tasks comply with the QAPjP, FSP, Health and Safety Plan (HASP), and all supporting documentation associated with the project. The project manager coordinates all field and laboratory activities, and may delegate any or all the above responsibilities.

1.2.5 Health and Safety Officer

The HSO is the person located at the work site who serves as the primary contact for health and safety issues. The HSO has specific responsibilities as stated in the HASP. The HSO is authorized to verify compliance to the HASP, conduct conformance inspections, require and monitor corrective actions, and monitor and require corrections to decontamination procedures, as appropriate. The HSO is supported by other health and safety personnel at the work site (safety engineer, industrial hygienist [IH], radiological control technician [RCT], radiological engineer, and facility representative), as necessary.

Personnel who will serve as the HSO or alternate HSO must be qualified to recognize and evaluate hazards, and have the authority to take or direct actions to ensure that workers are protected. The HSO may also be the IH, safety engineer, or the sampling field team leader (FTL), depending on the hazards, complexity, and size of the activity involved. Environment, safety, and health responsibilities of the HSO must not conflict with the role of the HSO at the work site. If it is necessary for the HSO to leave the site, an alternative individual will be appointed by the HSO to fulfill this role, and the identity of the acting HSO will be recorded in the sampling FTL logbook.

1.2.6 Industrial Hygienist

The LMITCO IH is the primary source of information regarding nonradiological hazardous and toxic agents at the work site. The IH will be present at the task site during any work operations when a chemical hazard to operations personnel may exist or is anticipated. The IH assesses the potential for worker exposures to hazardous agents in accordance with LMITCO company procedures and the LMITCO *Safety and Health Manual* (LMITCO 1997b). The IH assesses and recommends appropriate hazard controls to protect personnel, reviews the effectiveness of monitoring and personal protective equipment (PPE) required in the project HASP, and recommends changes as appropriate. Following an evacuation, the IH will assist in determining whether conditions at the work site are safe for reentry. Employees showing health effects resulting from possible exposure to hazardous agents will be referred to the Occupational Medical Program by the IH, their supervisor, or the HSO. The IH may have other duties at the work site as specified in the HASP, or in company procedures and manuals. During emergencies involving hazardous materials, IH measurements will be performed by members of the Emergency Response Organization (ERO).

1.2.7 Radiological Control Technician

The LMITCO RCT is the primary source of information and guidance on radiological hazards. The RCT will be present at the work site during any work operations when a radiological hazard to personnel may exist, or is anticipated. Responsibilities of the RCT include radiological surveying of the work site, equipment, and samples; providing guidance for radiological decontamination of equipment and personnel, and accompanying the affected personnel to the nearest INEEL medical facility for evaluation if necessary. The RCT must notify the sampling FTL of any radiological occurrence that must be reported as directed by the Radiological Control Manual (LMITCO 1996a). The RCT may have other duties at the work site as specified in other sections of the project HASP and this FSP, or in company procedures and manuals.

1.2.8 Sampling Field Team Leader

The sampling FTL has direct and final responsibility for the safe and successful completion of the sampling project. The FTL manages field operations and executes the work control documents (e.g. FSP), enforces site control, documents work site activities, and conducts daily safety briefings. Additional responsibilities include, but are not limited to:

- Technical and operational requirements of the sampling activities
- Preparation for sampling
- Field analysis and decontamination activities
- Equipment removal procedures
- Packaging and shipping of samples
- Clean-up of the site after sampling is completed
- Closure of all waste management tasks
- Personnel safety at the work site.

These responsibilities may be transferred to a designated representative meeting all FTL training requirements. The sampling FTL may be a member of the sampling team. All health and safety issues at the work site must be brought to the attention of the sampling FTL. The FTL may also act as the HSO.

1.2.9 Sampling Team

The sampling team will perform the onsite tasks necessary to collect the samples. Team members will not enter the sampling area alone. The sampling team will consist of a minimum of two members, and the buddy system will be implemented. The IH and RCT will support the team on an as-needed basis.

1.2.10 Sample Management Office

The INEEL Sample Management Office (SMO) will be responsible to obtain required laboratory services and ensure that data generated from samples collected and analyzed meet the needs of the project, thereby validating all analytical laboratory data according to resident protocol.

The SMO contracted laboratories will have overall responsibility for laboratory technical quality, laboratory cost control, laboratory personnel management, and adherence to agreed-upon laboratory schedules. Laboratory personnel will be responsible to prepare analytical reports, ensure chain-of-custody (COC) information is complete, and ensure all Quality Assurance/Quality Control (QA/QC) procedures are implemented in accordance with SMO generated task order statements of work (SOWs) and master task agreements.

2. SITE BACKGROUND

2.1 Site Description and Background

The INEEL is a U.S. Government-owned facility managed by the DOE. The eastern boundary of the INEEL is located 52-km (32-mi) west of Idaho Falls, Idaho. The INEEL site occupies approximately 2,305-km^2 (890-mi^2) of the northwestern portion of the Eastern Snake River Plain in southeast Idaho. The TAN TSF is located in the north-central portion of the INEEL as shown in Figure 2.

TAN was constructed between 1954 and 1961 to support the Aircraft Nuclear Propulsion (ANP) Program sponsored by the U.S. Air Force and the U.S. Atomic Energy Commission (AEC). The mission of the ANP Program was to test the concept of a nuclear-powered airplane. The TSF Hot Shop and hot cells were used from 1962 until the 1970s in support of the Loss-of-Fluid Test Facility (LOFT) and miscellaneous minor examinations and tests for the Test Reactor Area (TRA) and the Power Burst Facility (PBF). Beginning in 1980 the TAN TSF Hot Shop and hot cells supported research and development of material from the Three-Mile Island (TMI)-2 reactor. During the mid-1980s, the final tests for the LOFT program were supported by the TSF Hot Shop.

2.1.1 TSF-09 V-Tank and TSF-18 V-9 Areas

The TSF Intermediate-Level (Radioactive) Waste Disposal Site (TSF-09), and the TSF-18 Contaminated Tank southeast of TSF-09, are situated in an open area east of TAN-616 and north of TAN-607 (see Figure 3).

Currently, the TSF-09 V-tanks and TSF-18 have been combined because the two sites are contiguous, have similar contamination, and will likely require the same remedial decision. TSF-09 consists of three abandoned stainless steel tanks, referred to as V-1, V-2, and V-3, installed in the 1950s, and used for the treatment and storage of radioactive and other liquid wastewater. Waste was discharged to the three 37,850-L (10,000-gal.) tanks until the early 1980s. Surface soils surrounding the tanks became contaminated because of spills during operation of the tanks (LMITCO 1994). Water was removed from the tanks in 1982. Removal of the water resulted in a spill of approximately 6,435 L (1,700-gal.) of water. The liquid puddled in a depression along the west side of the tank man-ways, and flowed north, out of the radiologically controlled area, through a shallow ditch. Approximately 3.8-m^3 of radioactively contaminated soil in a 0.9-m^2 area north of the tanks was removed; however there is no indication that clean soil was brought in. A gasket was installed in the manhole on V-3 in March 1996 to prevent the infiltration of snowmelt and rainwater into the tank. The problem was suspected because of rising liquid levels measured in the tank, and the location of the tank in a topographical low.

TSF-18 consists of a single tank, referred to as V-9. The tank is a 1,514-L (400-gal.) stainless steel sump tank installed in the 1950s, that was used to filter and treat wastewater as a part of the Intermediate-Level Radioactive Waste Disposal System (TSF-09). Preliminary scoping information and historical site data indicate that the inside of the tank is radioactively contaminated, and that the soil around TSF-18 is also likely contaminated from processes at TSF-09. The sand filter was sampled in 1997, and results show significant PCB and radiological contamination. The concrete structure, located above ground surface near V-9, contains sand that was used as a filter. Current data does not indicate that the tanks have leaked. The risk assessment was not calculated for the tank contents in the OU 1-10 Comprehensive RI/FS because there is no evidence the tanks have leaked; however, the tank contents were included in the feasibility study because the waste material must be managed in a manner consistent with applicable regulations (IDHW-DEQ 1998).

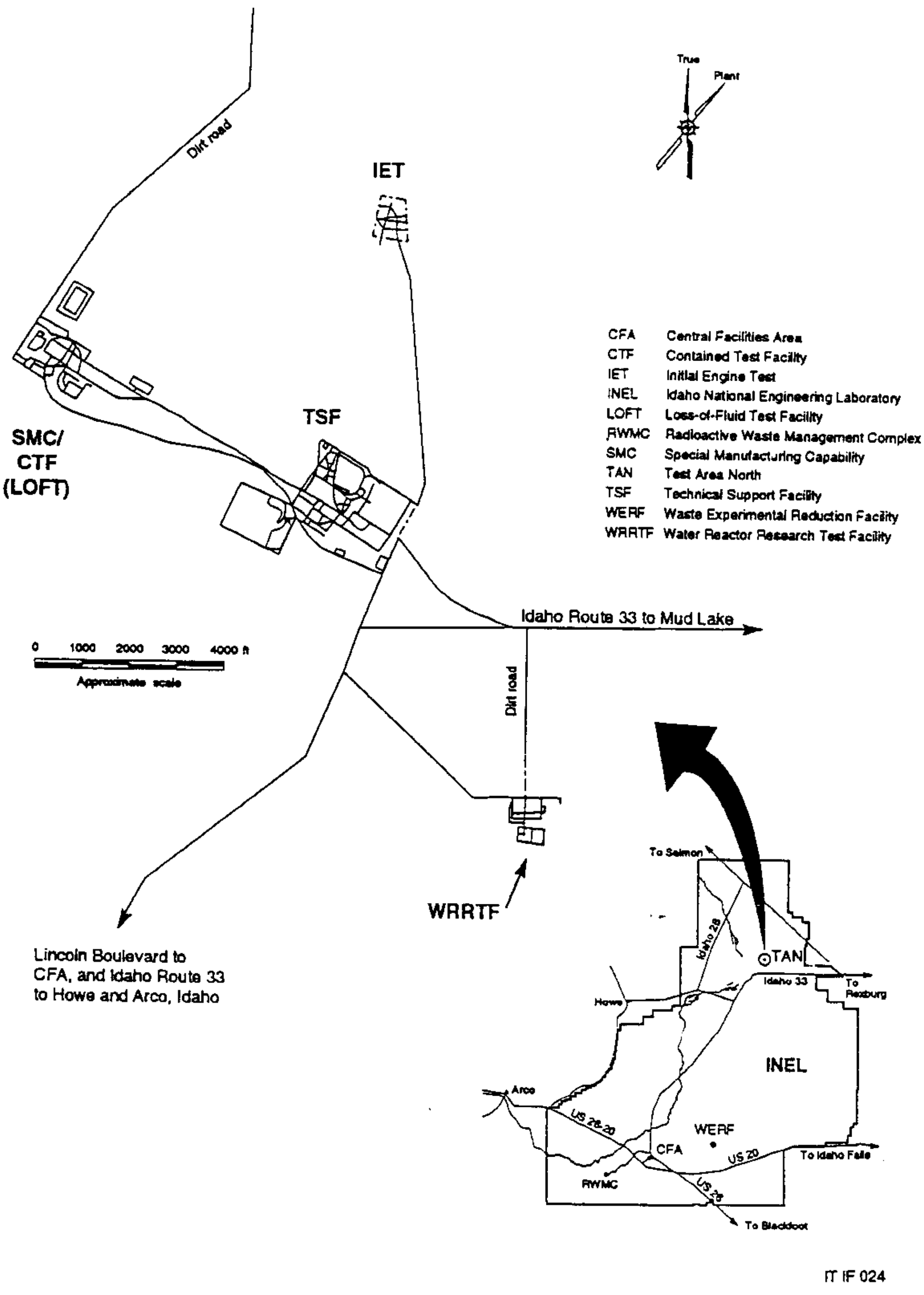


Figure 2. Location of Test Area North Technical Support Facility.

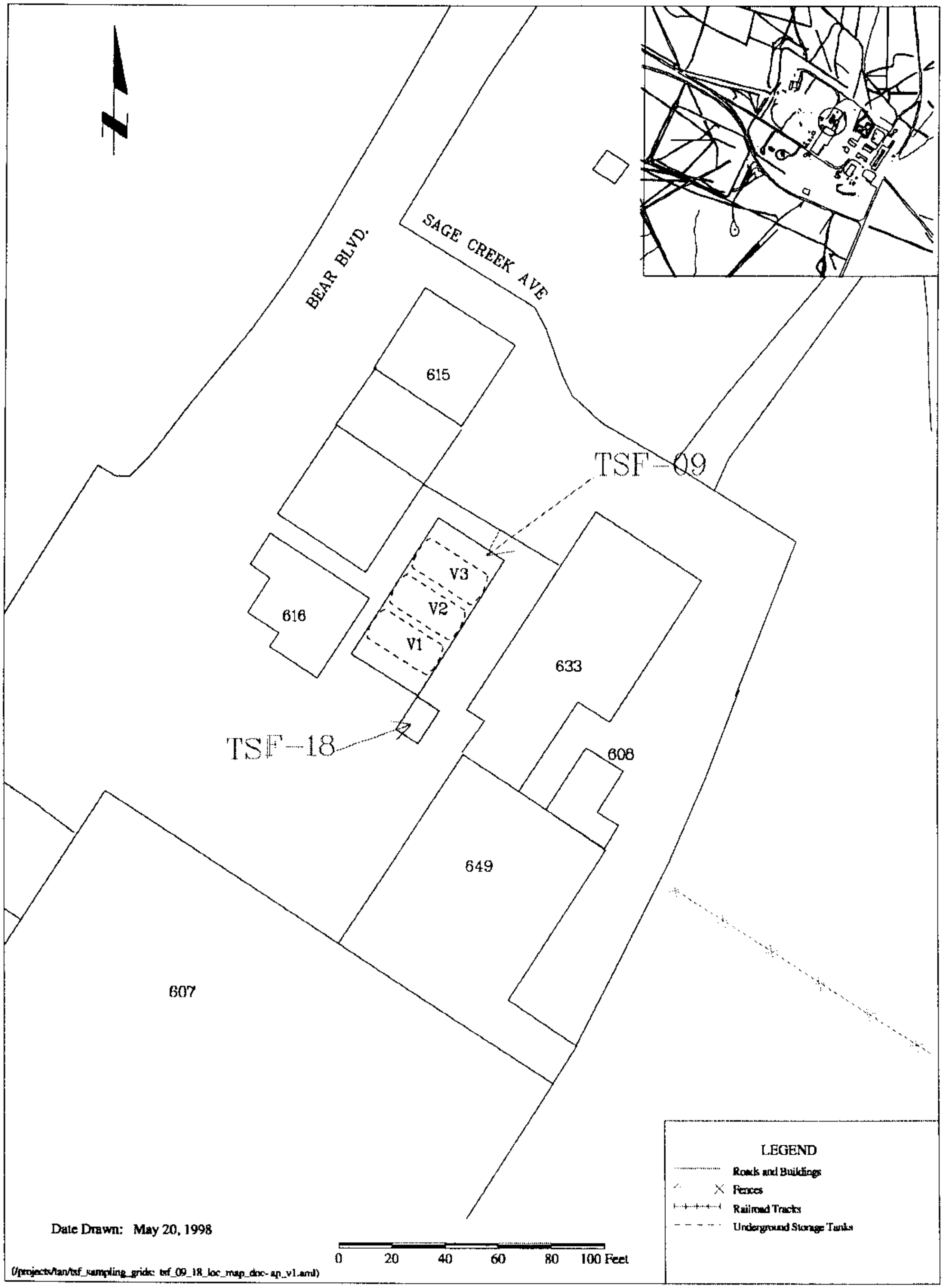


Figure 3. OU 1-05: TSF-09 and TSF-18 site and sampling map.

2.1.2 TSF-26 PM-2A Tanks Area

TSF-26 is a large, open soil area, located northwest of the OU1-07B interim action groundwater treatment facility, containing elevated levels of radioactive contamination. The area also contains two underground storage tanks (USTs), (tanks 709 and 710) that were used for the treatment and storage of radioactive and other wastewater from the Intermediate-Level Radioactive Waste Disposal System (TSF-09). Figure 4 shows the location of TSF-26 and tanks 709 and 710. The tanks were installed in 1953 and are seated on concrete cradles. The tops of the tanks are buried 4.4-m (14.5-ft) below ground surface (BGS). The PM-2A tanks were used to store concentrated, low-level radioactive waste from the TAN-616 evaporator and the TSF-09 V-tanks. Past operations at the TSF-26 site resulted in contaminated surface soil due to spills and overflows from waste treatment operations, and the storage of contaminated material at the site.

The TSF-26 site was decontaminated and decommissioned in 1981. The buildings, evaporator, contaminated surface soil, and buried debris were removed, the liquid in the TSF-26 tanks was pumped out, and the remaining sludge was dried with diatomaceous earth. The concrete vaults used to store the radioactive liquids from the TSF-26 tanks leaked, resulting in surface soil contamination northeast of the TSF-26 tank area. In 1981, a 5,671-m^2 (61,250-ft^2) area surrounding the TSF-26 tanks was covered with a minimum of 0.15 m (0.5 ft) of clean soil and seeded with native grasses.

The risk assessment was not calculated for the tank contents in the OU 1-10 Comprehensive RI/FS because there is no evidence the tanks have leaked; however, the tank contents were included in the RI/FS because the waste material must be managed in a manner consistent with applicable regulations.

2.2 Source, Nature and Extent of Contamination

2.2.1 TSF-09 V-Tank and TSF-18 V-9 Areas

The tanks at TSF-09 and TSF-18 were installed in the early 1950s as part of the system designed to collect radioactive liquid effluents generated in the hot cells, laboratories, decontamination facilities at TAN, and waste from the Initial Engine Test Facility (IET). Based on process knowledge, previously collected sampling data, and site use, the known or suspected types of contamination at the sites include metals (barium, cadmium, chromium, lead, mercury, and silver), VOCs (trichlorethene, 1,1,1-trichloroethane, carbon tetrachloride, and acetone), SVOCs (PCBs and Stoddard solvent), and radionuclides (Co-60, Sr-90, Cs-137 and various isotopes of plutonium and uranium).

The shallow soils surrounding the tanks were characterized for radiological contamination in 1983. More recently, the 1993 Track 2 investigation involved the drilling of three boreholes. Location A was located just south of the valve pit next to TSF-18, Location B was located just off the southwest corner of Tank V2, and Location C was placed in the drainage ditch north of Tank V-3. The soil at Location A was sampled at the surface from 0 to 0.15-m (0 to 0.5-ft) deep, the shallow subsurface from 0 to 1.2-m (0 to 4-ft) deep, and the deep subsurface from 6.1 to 7.4-m (20 to 24-ft) deep. The soil at Location B was sampled at the surface from 0 to 0.15-m (0 to 0.5-ft) deep, and the shallow subsurface from 1.5 to 2.5-m (5 to 8-ft) deep. The soil at location C was sampled at the surface from 0 to 0.15-m (0 to 0.5-ft) deep, the shallow subsurface from 0 to 1.4-m (0 to 4.5-ft) deep, and the deep subsurface from 5.5 to 6.1-m (18 to 22-ft) deep. Results from the Track 2 investigation show surface soil contamination ranged from 16.0 to 18.0-pCi/g gross alpha, and 76.0 to 1,110.0-pCi/g gross beta. Subsurface measurements of gross alpha ranged from 9.2 to 26.0 pCi/g, gross beta ranged from 47.0 to 160.0 pCi/g. Cobalt-60 and Cesium-137 were found at depth with maximum concentrations of 0.3 pCi/g and 103.0 pCi/g, respectively. The results of the inorganic analyses of samples from various intervals in the boreholes did not indicate

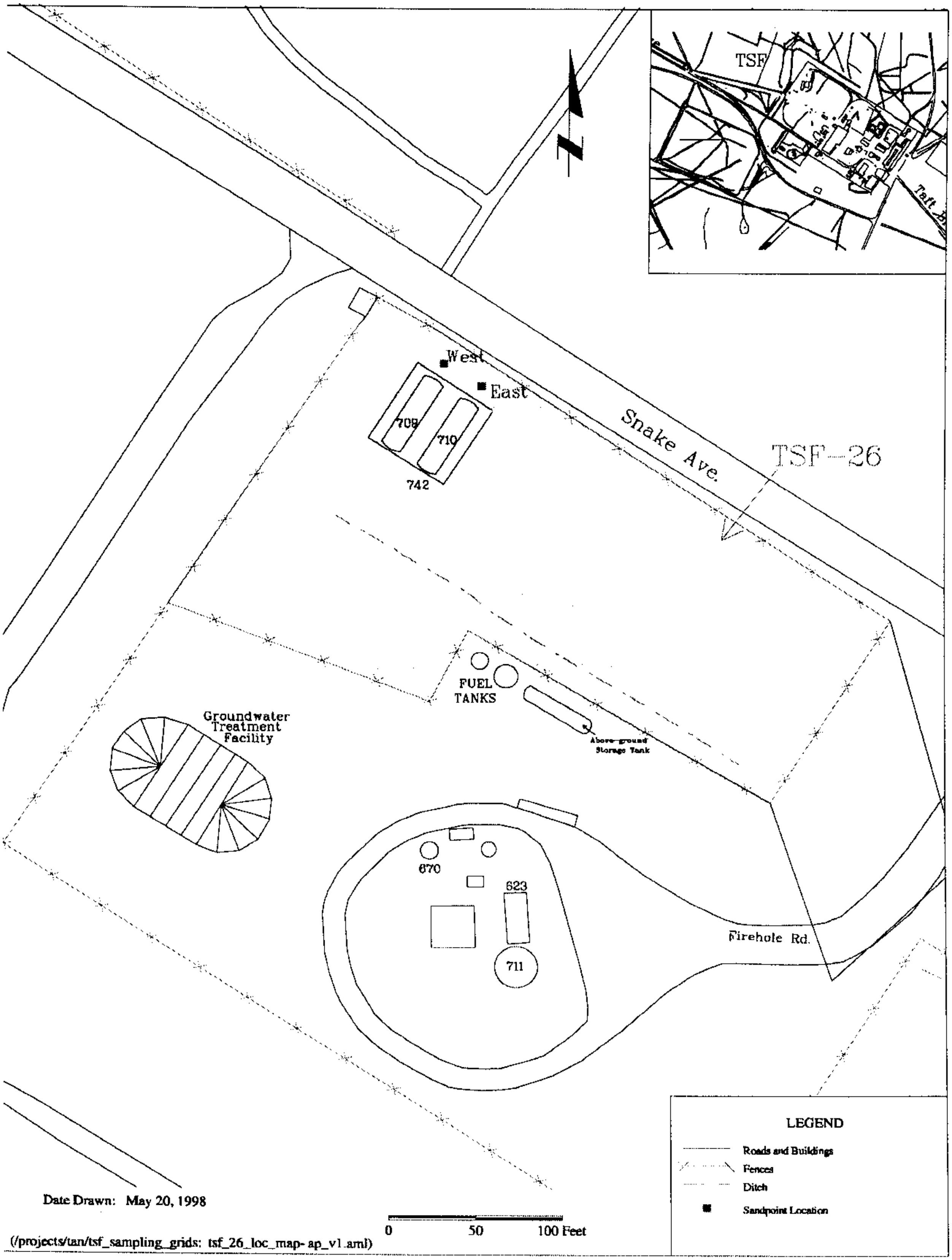


Figure 4. TSF-26 location.

elevated concentrations of metals at any of the locations or depths. VOC and SVOC analyses show very low concentrations of acetone, trichloroethylene and Aroclor-1254. Figure 5 summarizes the Track 2 summary data for TSF-09 and TSF-18 (INEL 1994). Analytical results from the sand filter sampling shows Aroclor-1260 concentrations of 290 ppm, gross alpha and gross beta concentrations of 1.65×10^4 pCi/g and 3.73×10^5 pCi/g, respectively. The radioactivity is attributed primarily to Co-60 ($3.82 \times$ k10^4 pCi/g), Sr 90 (1.03×10^5 pCi/g), Tc-99 (1.29×10^3 pCi/g), Cs-137 (1.09×10^5 pCi/g), and U-234 (2.19×10^4 pCi/g).

2.2.2 TSF-26 PM-2A Tanks Area

The PM-2A tanks were used from the time they were installed, in the mid-1950s, until just prior to the D&D of the PM-2A facility. The tanks were used to store concentrated low-level radioactive wastes from the TAN-616 evaporator and the TSF-09 V-Tanks. Based on process knowledge, previously collected sampling data, and site use, the known or suspected types of contamination at the PM-2A site include metals (barium, cadmium, chromium, lead, mercury, and silver), VOCs (trichloroethene, 1,1,1-trichloroethane, carbon tetrachloride, and acetone), SVOCs (Stoddard fluid), and radionuclides (C-60, Sr-90, Cs-137, and isotopes of plutonium and uranium).

A DOE environmental survey, conducted in 1988 by the DOE Headquarters environmental survey team from Oak Ridge National Laboratory, of four boreholes near the PM-2A tanks indicated relatively low levels of Cs-137 contamination (1.7 to 120-pCi/g) in the soil to 5.2 m (17 ft). Samples were not collected below this depth (DOE 1989).

The Track 2 investigation involved the drilling of four boreholes—three shallow (1.7 m) and one deep (9.1 m). Radiological analyses were performed on the surface samples. The results indicated elevated gross beta, and Co-60 and Cs-137 activities in the TSF-26 soils. No VOCs, SVOCs, or PCBs were detected in the soil samples. Figure 6 summarizes the Track 2 sampling data for TSF-26. The west sandpoint was sampled on July 20, 1993. The sandpoints are small diameter, vadose-zone monitoring ports intended for the monitoring of leaks from the PM-2A tanks or associated piping. The interior of the west sandpoint was observed to be covered with an oily substance, and an oil-soaked rag was stuffed into the sandpoint. The source of the VOCs detected in the sandpoint during the 1993 Track 2 study, may have been the oily substance observed on the walls of the sandpoint and the rag, and may not be indicative of environmental contamination or leaks. It was determined that the sandpoints were not capable of producing high quality environmental samples (INEL 1994).

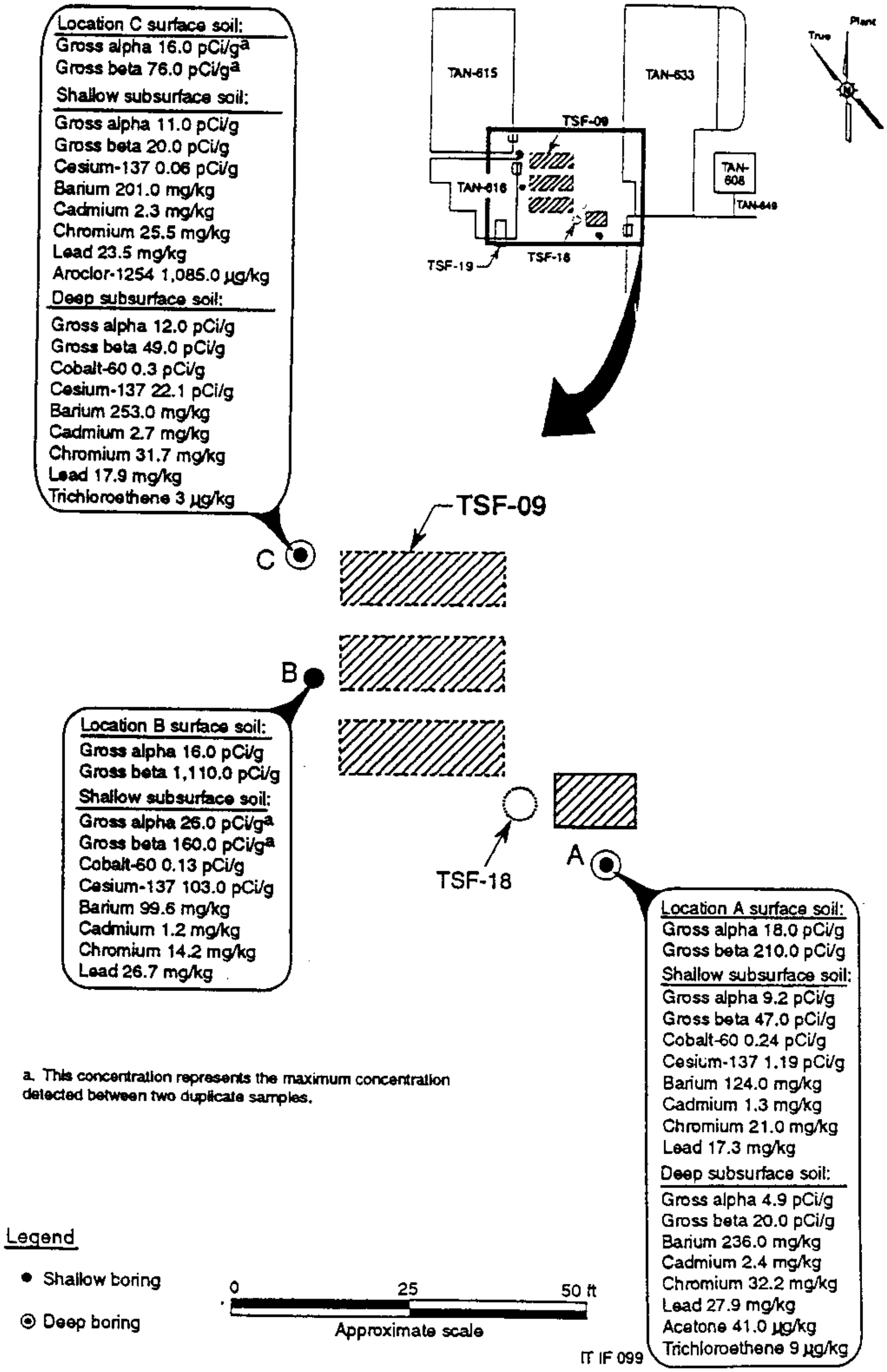
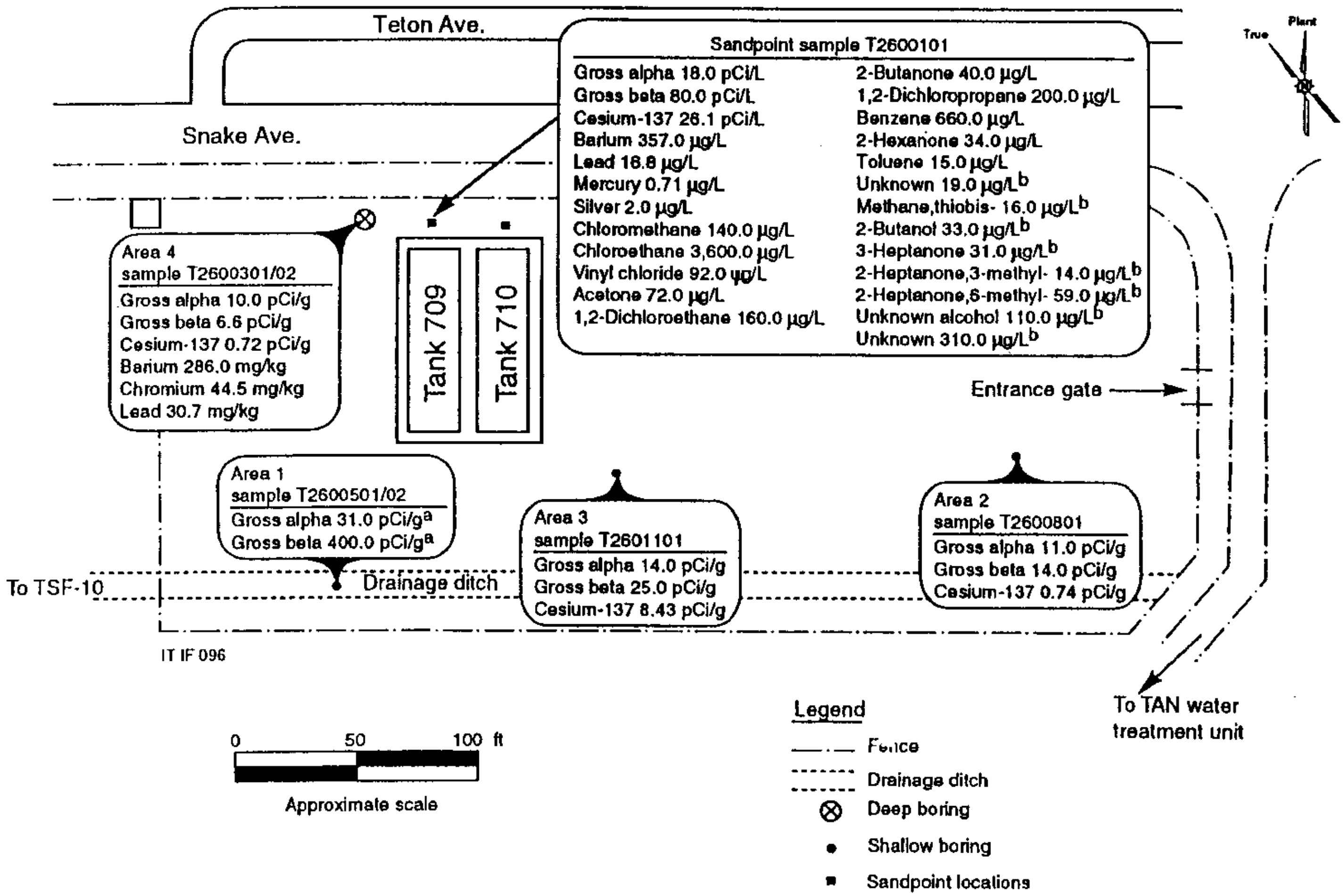


Figure 5. TSF-09 and 18 1993 Track 2 summary data.



a. This concentration represents the maximum concentration detected between two duplicate samples, and not the concentration found in a singular sample.

b. Tentatively identified compound.

Figure 6. TSF-26 1993 Track 2 summary data.

3. SAMPLING OBJECTIVES

This section presents an identification of the data needs required for conducting the investigations at TSF-09, TSF-18, and TSF-26. Data needs and data quality objectives (DQOs) are defined for each of the sites.

3.1 Data Needs

Data needs have been determined through the evaluation of existing data and the projection of data requirements anticipated for the management of TSF-09, TSF-18, and TSF-26 soils as no-longer-contained-in for F001 waste constituents, and characterized to verity that the soils do not fail the TCLP for metals. Subsurface soil samples will also be collected in TSF-09 and 18 and analyses performed to provide engineering data to support the possible application of ISV at the V-tank site. The DQOs are listed in Table 1.

3.2 QA Objective for Measurement

The QA objectives for measurement will meet or surpass the minimum requirements for data quality indicators established in the QAPjP. This reference provides minimum requirements for the following measurement quality indicators: precision, accuracy, representativeness, completeness, and comparability. Precision, accuracy and completeness will be calculated as per the QAPjP.

3.2.1 Precision

Precision is a measure of the reproducibility of measurements under a given set of conditions. In the field, precision is affected by sample collection procedures and the natural heterogeneity in the soil. Overall precision (field and laboratory) can be evaluated by the use of duplicate samples collected in the field.

Laboratory precision will be based on the use of laboratory generated duplicate samples or matrix spike/matrix spike duplicate samples. Evaluation of laboratory precision will be performed during the method data validation process.

Field precision will be based upon analysis of co-located field duplicate or split samples. For samples collected for laboratory analyses, a field duplicate will be collected at a minimum frequency of 1/20 environmental samples.

3.2.2 Accuracy

Accuracy is a measure of bias in a measurement system. Laboratory accuracy is demonstrated using laboratory control samples, blind QC samples, and matrix spikes. Evaluation of laboratory accuracy will be performed during the method data validation process. Overall accuracy is affected by sample preservation and handling, field contamination, and the sample matrix in the field. The effects of the first three can be assessed by evaluation of the results of equipment rinsates. Field accuracy will be determined for samples collected for laboratory analysis.

Table 1. Data Quality Objectives for WAG 1 sampling.

Activity	Objective	Data Use	Analyte(s)	Analytical Method
TSF-09 and TSF-18	Investigate concentrations of F001 analytes of concern in upper 10-ft of soils	Support of no-longer-contained-in determination	Methylene chloride, 1,1,1-trichloroethane, carbon tetrachloride, trichloroethene, tetrachloroethene	TCLP and totals for VOCs
TSF-09 and TSF-18	Investigate concentrations of PCBs in upper 10-ft. of soils	Support as-found concentrations of <2 ppm for PCBs	Aroclor-1254 and Aroclor-1260	Totals for PCBs
TSF-09 and TSF-18	Investigate concentrations of TCLP metals	Determine whether soils are considered characteristic hazardous waste	Arsenic, barium, cadmium, chromium, lead, mercury, selenium, silver	TCLP for metals
TSF-09 and TSF-18	Determine "Whole Rock Properties"	Provide engineering data for the possible ISV of the site.	Whole Rock Analysis to include Si, Na, K, Ca, Fe, Al, Cr, Mg, Mn, P, Ti, U, Cs, and Sr	ICP with fusion digestion to properly account for silicon
			Total carbon, inorganic carbonates, moisture content, bulk density, particle size distribution	
TSF-26	Investigate concentrations of F001 analytes of concern in upper 10-ft of soils	Support of no-longer-contained-in determination	Methylene chloride, 1,1,1-trichloroethane, carbon tetrachloride, trichloroethene, tetrachloroethene, Aroclor-1254, Aroclor-1260	TCLP and totals for VOCs
TSF-26	Investigate concentrations of PCBs in upper 10-ft. of soils	Support as-found concentrations of <2 ppm for PCBs	Aroclor-1254 and Aroclor-1260	Totals for PCBs
TSF-09 and TSF-18	Investigate concentrations of TCLP metals	Determine whether soils are considered characteristic hazardous waste	Arsenic, barium, cadmium, chromium, lead, mercury, selenium, silver	TCLP for metals

3.2.3 Representativeness

Representativeness is a qualitative parameter that expresses the degree to which the sampling and analysis data reflect the characteristics being measured. Representativeness will be evaluated by comparing the number of samples collected with the number necessary to be representative and confirming that sample locations were properly located.

3.2.4 Completeness

Completeness is a measure of the quantity of usable data collected during an investigation. Field sampling, and field measurement completeness is affected by such factors as equipment and instrument malfunctions and insufficient sample recovery. The QAPjP requires an overall completeness goal of 90% for noncritical samples and 100% for critical samples.

Critical data points are sample locations for which valid data must be obtained for the sampling event to be considered complete. The data is absolutely necessary for a final determination to be made regarding the site being sampled. The completeness goal for the TSF-09, TSF-18, and TSF-26 soils is 90% for the TCLP VOC, PCB totals, and TCLP metals, and 100% for the VOC totals.

3.2.5 Comparability

Comparability is a qualitative characteristic that refers to the confidence with which one data set can be compared to another. Comparable data must be obtained using unbiased sample designs. If sampling designs are biased, the reasons for selecting another design should be well documented.

Data from TSF-09, TSF-18, and TSF-26 will be collected and analyzed for VOCs and PCBs using comparable sampling techniques and laboratory analytical methods that were used for previous site investigations. This data will be comparable to historical data.

3.3 Sampling Objectives

The primary objective for the subsurface soil sampling in the TSF-09, TSF-18, and TSF-26 areas is to (a) obtain data for the basis of a no-longer-contained-in determination under Idaho Department of Health and Welfare Division of Environmental Quality guidance, (b) further support the as-found levels of PCBs, (c) determine the levels of TCLP metals, and (d) collect engineering data for the possible ISV of the TSF-09 and TSF-18 site.

3.4 Data Validation

Laboratory generated data from the TSF-09, TSF-18, and TSF-26 soil samples will be validated to Level B. Data validation will be performed as per LMITCO technical procedure TPR-79, "Levels of Analytical Method Data Validation" (LMITCO 1995).

4. SAMPLING LOCATION AND FREQUENCY

The material presented in this section is intended to support the DQOs in Section 3.

4.1 QA/QC Samples

The QA/QC samples will be included to satisfy the QA requirements for the field operation as per the QAPjP. Laboratories approved by the SMO will be used for sample analyses.

4.1.1 TSF-09 and TSF-18 V-Tank Areas

Duplicate samples will be collected for TCLP VOC, VOC totals, PCB totals, and TCLP metals in borehole D6, at a depth interval from 1 to 3-ft. Duplicate samples for Whole Rock, total carbon, inorganic carbonate, and physical properties will be collected in borehole D6, or designated alternate, at a depth interval from 10 to 12 ft. Rinsates will be collected from the decontamination of the sample equipment prior to beginning the sampling of the TSF-09 and TSF-18 area soils, additionally, rinsates will be collected from the sample equipment on the last day of sampling.

4.1.2 TSF-26 PM-2A Tanks Area

Duplicate samples will be collected for TCLP VOC, VOC totals, PCB totals, and TCLP metals in borehole G3, at a depth interval from 1 to 3-ft. Rinsates will be collected from the decontamination of the sample equipment prior to beginning the sampling of the TSF-26 area soils, additionally, rinsates will be collected from the sample equipment on the last day of sampling.

4.2 Sampling Locations

The following sections describe the sampling methods and locations, and the rationale for locations of sample selection. Sample grids were selected to completely enclose the areas to be sampled. The individual sample points were then selected at random to provide representative samples of the areas.

4.2.1 TSF-09 V-Tank and TSF-18 V-9 Areas

The V-tank soil area (TSF-09 and TSF-18) is a small soil contamination area adjacent to building TAN 616. The contaminants of concern are VOCs including methylene chloride, 1,1,1-trichloroethane, carbon tetrachloride, trichloroethene, tetrachloroethene, PCBs including Aroclor-1254, Aroclor-1260, and TCLP metals including arsenic, barium, cadmium, chromium, lead, mercury, selenium, and silver. These were determined from process knowledge and previous site investigations. The data from this sampling effort is to be used in a no-longer-contained-in determination for F001 listed constituents, to support the "as found" concentrations of the PCBs, and to characterize the soils for TCLP metals.

Assuming a 95% confidence upper bound level, it was determined that 12 samples would reasonably achieve the desired confidence level of 90%. The historical data available reports small concentrations that are close to the method detection limits. Four boreholes with three samples collected from discrete depth intervals within each borehole will yield a statistically significant number of samples from the TSF-09 and TSF-18 area (Atwood 1998; Chase 1992). The borehole locations were picked randomly from the 3.0-m by 3.0-m (10-ft by 10-ft) grid spacing. The sample grid and primary borehole locations are shown on Figure 7. Borehole locations are taken as the center of each grid box. Samples are to be collected at depths of 0.3 to 0.9 m (1 to 3 ft), 1.5 to 2.1 m (5 to 7 ft), and 2.4 to 3.0 m (8 to 10 ft).

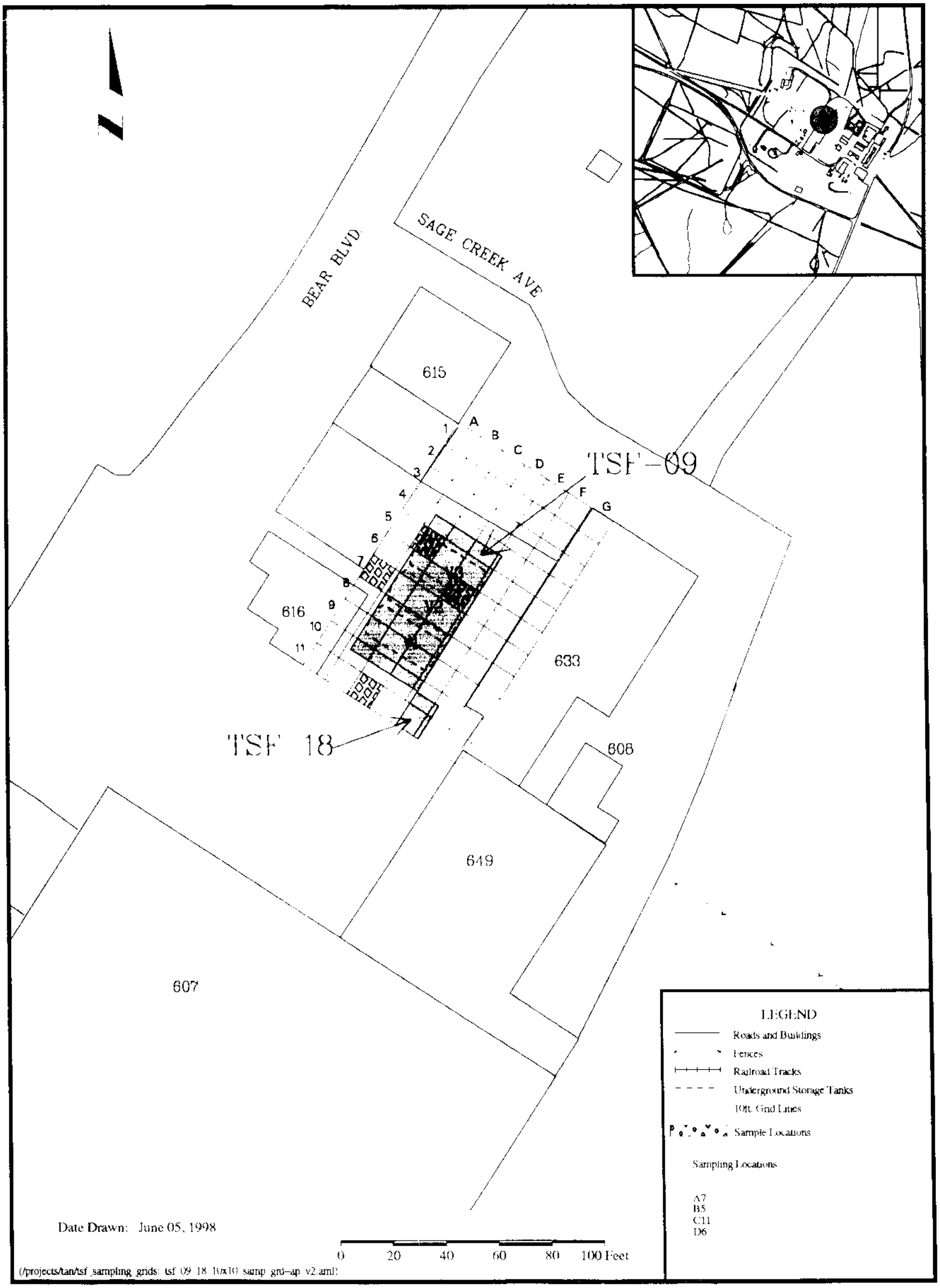


Figure 7. TSF-09 and 18 sampling grid.

Subsurface samples will also be collected at depths of 3.0 to 3.7 m (10 to 12 ft), 4.3 to 4.9 m (14 to 16 ft), and 5.5 to 6.1 m (18 to 20 ft) in borehole D6, or another designated alternate. The same sampling method will be employed for these sample intervals. Analyses will be performed on these samples to determine the geochemical and physical properties of materials to be treated by ISV. The samples will be collected from location D6, or another designated alternate. The location of the sample point and sample depths were selected to be biased near the tanks.

4.2.2 TSF-26 PM-2A Tanks Area

The PM-2A tanks soil area (TSF-26) is a soil contamination area adjacent to Snake Avenue. The contaminants of concern are VOCs including methylene chloride, 1,1,1-trichloroethane, carbon tetrachloride, trichloroethene, tetrachloroethene, and PCBs including Aroclor-1254, Aroclor-1260. These were determined from process knowledge and previous site investigations. The data from this sampling effort is to be used in a no-longer-contained-in determination for F001 listed constituents, to support the "as found" concentrations of the PCBs, and to characterize the soils for TCLP metals.

Assuming a 95% confidence upper bound level, it was determined that 18 samples would reasonably achieve the desired confidence level of 90%. Historical data report small concentrations close to the method detection limits. Six boreholes with three samples collected from discrete depth intervals within each borehole will yield a statistically significant number of samples from the TSF-26 area (Atwood 1998; Chase 1992). The borehole locations were picked randomly from the 15.2 by 15.2-m (50 by 50-ft) grid spacing. The sample grid and primary borehole locations are shown on Figure 8. Borehole locations are taken as the center of each grid box. Samples are to be collected at depths of 0.3 to 0.9 m (1 to 3 ft), 1.5 to 2.1 m (5 to 7 ft), and 2.4 to 3.0 m (8 to 10 ft).

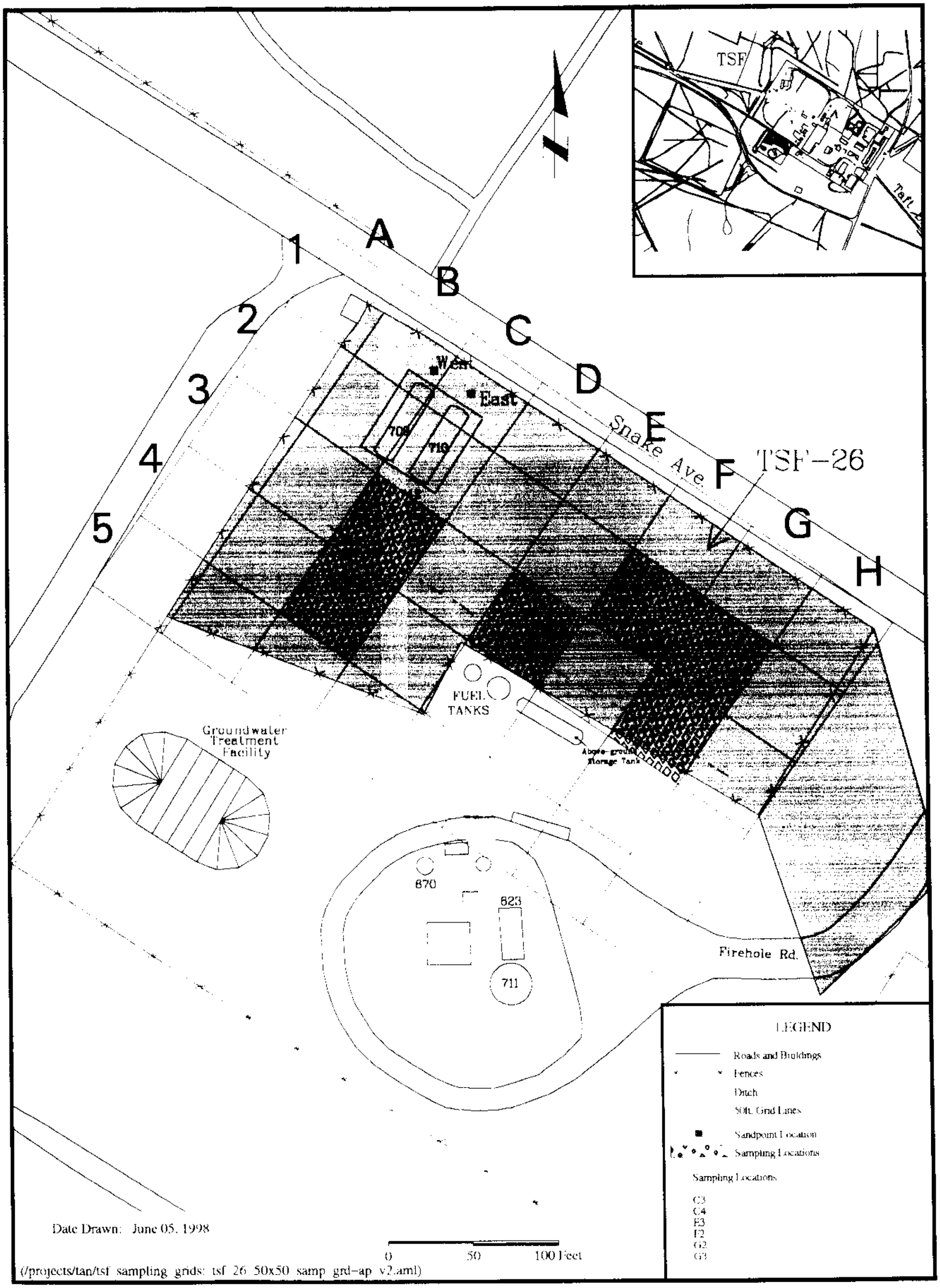


Figure 8. TSF-26 sampling grid.

5. SAMPLE DESIGNATION

5.1 Sample Identification Code

A systematic character identification (ID) code will be used to uniquely identify all samples. Uniqueness is required for maintaining consistency and preventing the same ID code from being assigned to more than one sample.

The first through third designator of the code, **1WG**, refers to the sample originating from WAG 1. The next three numbers designate the sequential sample number for the project. A two-character set (i.e. **01**, **02**) will be used to designate field duplicate samples. The last two characters refer to a particular analysis and bottle type. Refer to the SAP tables in Appendix A for specific analysis type designations.

For example, a subsurface soil sample collected in support of WAG 1 sampling might be designated as "1WG00101PC," where (from left to right):

- **1WG** designates the sample as originating from WAG 1
- **001** designates the sequential sample number
- **01** designates the type of sample (**01** = original, **02** = field duplicate)
- **PC** designates PCB totals analysis.

A SAP table/database will be used to record all pertinent information associated with each sample ID code.

5.2 Sampling and Analysis Plan Table/Database

5.2.1 General

A SAP table format was developed to simplify the presentation of the sampling scheme for project personnel. The following sections describe the information recorded in the SAP table/database which is presented in Appendix A.

5.2.2 Sample Description Fields

The sample description fields contain information relating individual sample characteristics.

Sampling Activity—The sampling activity field contains the first six characters of the assigned sample number. The sample number in its entirety will be used to link information from other sources (field data, analytical data, etc.) to the information in the SAP table for data reporting, sample tracking, and completeness reporting. The sample number will also be used by the analytical laboratory to track and report analytical results.

Sample Type—Data in this field will be selected from the following:

- REG for a regular sample

- QC for a QC sample.

Media—Data in this field will be selected from the following:

- Soil for regular and QA/QC samples.

Collection Type—Data in this field will be selected from the following:

- FBLK for field blanks
- GRAB for grab
- RNST for rinsates
- DUP for duplicate samples.

Planned Date—This date is related to the planned sample collection start date.

5.2.3 Sample Location Fields

This group of fields pinpoints the exact location for the sample in the three-dimensional space, starting with the general **Area**, narrowing the focus to an exact **Location** geographically, then specifying the **Depth in** the depth field.

Area. The area field identifies the general sample-collection area. This field should contain the standard identifier for the INEEL area being sampled. For this investigation, samples are being collected from the TSF-09 and TSF-18 V-tanks area, and TSF-26 PM-2A tanks area at TAN TSF. The area field identifier will correspond to these two sites.

Location. This field may contain geographical coordinates, x-y coordinates, building numbers, or other location identifying details, as well as program specific information such as borehole or well number. Data in this field will normally be subordinate to the area. This information is included on the labels generated by the SMO to aid sampling personnel.

Type of Location. The type of location field supplies descriptive information concerning the exact sample location. Information in this field may overlap that in the location field, but it is intended to add detail to the location.

Depth. The depth of a sample location is the distance in feet from surface level or a range in feet from the surface.

5.2.4 Analysis Types

AT1-AT20. These fields indicate analysis types (radiological, chemical, hydrological, etc.). Space is provided at the bottom of the form to clearly identify each type. A standard abbreviation should also be provided if possible.

6. SAMPLING PROCEDURES, EQUIPMENT, AND WASTE MANAGEMENT

The following sections describe the sampling procedures and equipment to be used for the planned sampling and analyses and field measurements described in this FSP. Prior to the commencement of any sampling activities, a presampling meeting will be held to review the requirements of the FSP and HASP, and to verify that all supporting documentation has been completed.

6.1 Sampling Requirements

Sampling requirements for the WAG 1 investigation are outlined below. The sampling effort in TSF-09, TSF-18, and TSF-26 are for a select list of VOCs, PCBs, TCLP metals, and geologic and physical parameters.

6.1.1 TSF-09, TSF-18, and TSF-26 Subsurface Soil Sampling

The subsurface soil samples from TSF-09, TSF-18, and TSF-26 will be collected following procedures outlined in the current revision of TPR-61, "Soil Sampling" (LMITCO 1996b). The subsurface samples will be collected using a truck or trailer mounted auger rig with a hollow-stem auger, a direct push, dual tube soil sampling system, or a manually operated soil sampling auger. The samples will be placed inside sealed containers, immediately placed inside coolers with reusable ice, and maintained at a temperature of 4°C.

Subsurface samples from TSF-09/18 will also be collected at depths of 3.0 to 3.7 m (10 to 12 ft), 4.3 to 4.9 m (14 to 16 ft), and 5.5 to 6.1 m (18 to 20 ft) in borehole D6, or another designated alternate. The same sampling method will be employed for these sample intervals. Analyses will be performed on these samples to determine the geochemical and physical properties of materials to be treated by ISV.

The requirements for containers, preservation methods, sample volumes, and holding times for the soil sample analyses listed in Sections 4.2.1 and 4.2.2 are provided in Table 2.

6.1.2 Personal Protective Equipment

The PPE required for this sampling effort is discussed in the HASP (LMITCO 1998c).

Prior to final dispositioning, all PPE will be characterized based on soil sample and field screening results, and a hazardous waste determination shall be completed as per the requirements set forth in MCP 444, "Characterization Requirements for Solid and Hazardous Waste" (LMITCO 1998b).

6.1.3 Sampling Location Surveys

Prior to sampling, all sample location points will be surveyed in accordance with the requirements set forth in MCP-227, "Sampling and Analysis Process for Environmental Management Funded Activities" (LMITCO 1997c).

Table 2. Specific sample requirements.

Analytical Parameter	Container Size	Container Type	Preservation	Method	Hold Time
VOCs	125 mL	Glass, Teflon lined cap	4°C	8260A	14 days
TCLP VOCs	250 mL	Glass, Teflon lined cap	4°C	TCLP 1311, 8260A	14 days
PCBs	250 mL	Glass	4°C	8082	14 days
TCLP Metals	250 mL	Glass, Teflon lined cap	4°C	6010 (7470 for mercury)	180 days, 28 days
Whole rock/metals	250 mL	Glass or plastic	4°C	3062/6010A	180 days
Whole rock/metals	250 mL	Glass or plastic	4°C	3062/6010A	180 days
Total carbon	40 mL	Glass or plastic	4°C	MOSA 29-2.3	28 days
Inorganic carbonate	125 mL	Glass, Teflon lined cap	4°C	MOSA 11-2.3	28 days
Soil moisture content	125 mL	Glass	4°C	ASTM D2216-90	28 days
Bulk density	125 mL	Glass or plastic	4°C	ASTM D5057-90	28 days
Particle size density	125 mL	Glass or plastic	4°C	ASTM D421-85	28 days

6.1.4 Shipping Screening

Following sample collection, samples will be surveyed for external contamination and field screened for radiation levels. If necessary, a gamma screening sample will be collected and submitted to the Radiation Measurements Laboratory located at TRA for a 20-minute analysis prior to shipment. This determination will be made by the Radiological Control Technicians in the field.

6.2 Sampling Waste Management

Residual wastes generated during sampling and analysis may include the following:

- Unused, unaltered sample material
- Analytical residues
- Used sample containers, disposable sampling equipment
- Contaminated personal protective clothing (PPE), wipes, bags, other paper and plastic trash
- Decontamination fluids.

Solid, combustible wastes will be produced during sampling,. Combustible wastes will include personal protective equipment, wipes, smears, etc. Similar wastes will be produced at the laboratory, as well as analytical residues and decontamination solutions. Process knowledge will be used to determine the waste characteristics of laboratory wastes and the materials will be segregated by waste stream.

6.2.1 Hazardous Waste Determination

All of the wastes to be produced are considered solid wastes in accordance with the Resource Conservation and Recovery Act (RCRA) criteria cited in 40 CFR 261.2. RCRA defines a solid waste as a solid, liquid, or contained gas discarded by being abandoned or recycled, or that is inherently waste-like. RCRA requires that a hazardous waste determination be performed on all solid wastes. Documentation of the hazardous waste determinations for all of the wastes to be produced in this investigation (i.e., tank materials, the solid, combustible and noncombustible field and laboratory wastes, and the analytical residues, including altered sample materials and decontamination solutions) will be prepared, then reviewed and approved by the responsible manager and TAN Waste Characterization Team.

The waste in the TSF-09, TSF-18, and 26 tanks includes trichloroethene and several toxicity characteristic metals. RCRA regulations cited in 40 CFR 261.3(a)(iv) state that, ". . . a waste is a hazardous waste if it is a mixture of solid waste and a hazardous waste listed in Subpart D of Part 40 CFR 261." The trichloroethene in the TSF-09 tanks content is listed in the indicated Part as waste code F001. Therefore the tank wastes are regulated as a F001-listed waste. Soils in the TSF-09, TSF-18, and TSF-26 areas are contaminated as a result of past spills of the tank contents and past operations involving wastes in the tanks, and are considered to contain the F001-listed waste and characteristic metals, and must be managed as a hazardous waste (if discarded).

By extension this means that all solid wastes generated during operations described in this plan, that have been in contact with the contaminated soil and sediments at the TSF-09, TSF-18,, and TSF-26 sites become a mixture of a solid waste and a characteristic hazardous waste (i.e., F001 RCRA regulated).

The Toxic Substances Control Act (TSCA) regulations (i.e., the anti-dilution provision) indicate that if a PCB-containing material is mixed with another material, the resultant mixture is regulated as if it contained the PCB concentration of the original TSCA regulated material. The maximum PCB concentration detected in the TSF-09 tanks is 660 ppm. Oil removed from tank V-2 in 1981 reportedly contained 680 ppm Aroclor-1260. This would mean that soils contaminated by spills of tank wastes or pond sediments contaminated by discharges of waste from the radioactive liquid waste treatment system should be regulated as if they contain the PCB concentration found in the tanks (i.e., 680 ppm). However, according to EPA guidance, the TSCA "anti-dilution" provision doesn't take effect until remedial actions are implemented at Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) sites. The RI/FS is conducted under the provision that PCB-contaminated soil, in which the original PCB concentration was 50 ppm or greater, and in which the actual PCB concentration in the soil is 10 ppm or less, and regardless of when the spill occurred, is not regulated for disposal under 40 CFR, Part 761 (Wilkening 1998).

6.2.2 Waste Minimization and Segregation

Waste minimization for this project will be primarily achieved through design and planning to ensure efficient operations and that wastes are not generated unnecessarily.

Sampling and laboratory personnel will be responsible for segregating sanitary wastes from contaminated wastes, and for managing sanitary wastes. Several types of contaminated wastes are also expected to be generated during these operations. Segregation of these waste types will be required to facilitate subsequent waste management. Following analysis, any remaining unaltered samples will be segregated from all other wastes for return to the area of contamination. All other wastes contaminated by contact with the samples will be decontaminated for reuse, or disposed of by the analytical laboratory. Wastes will be segregated as combustibles, non-combustibles, and those containing free liquid. To the extent possible, only the contaminated portions of waste materials will be discarded as regulated waste (e.g., contaminated PPE will be separated from potentially contaminated PPE).

6.2.3 Waste Management and Disposition

All waste generated during sampling activities at the INEEL will be contained and maintained at the operation site until activities have been completed. At the conclusion of sampling, sanitary wastes will be disposed of at the INEEL landfill, following the protocols identified in the RRWAC. Contaminated (i.e., mixed low-level radioactive) wastes will be stored temporarily as ER investigation derived wastes (IDW) in the TAN-616 temporary accumulation area (TAA). The wastes will be disposed of as feasible, final disposal options for the stored wastes are identified. Waste may remain stored as CERCLA IDW until final remedial actions for the site are implemented under the Waste Area Group 1 Record of Decision. The mixed low-level radioactive wastes contaminated through contact with soils at the TSF-09, TSF-18, and TSF-26 sites may be reclassified as low-level radioactive waste, if the planned "no-longer-contained-in" determination for the soils is approved, and if it is determined that the TCLP metals are at levels less than those prescribed for regulation under RCRA.

7. DOCUMENTATION MANAGEMENT AND SAMPLE CONTROL

Section 7.1 summarizes document management and sample control. Documentation includes field logbooks used to record field data and sampling procedures, COC forms, and sample container labels. Section 7.2 outlines the sample handling and discusses COC, radioactivity screening, and sample packaging for shipment to the analytical laboratories. The analytical results from this field investigation will be documented in reports and used as a basis for RD/RA and no-longer-contained-in determination.

7.1 Documentation

The sample FTL will be responsible for controlling and maintaining all field documents and records, and for verifying that all required documents will be submitted to the LMITCO ER Administrative Records and Document Control (ARDC). All entries will be made in permanent ink. Errors will be corrected by drawing a single line through the error, and entering the correct information. The corrections will be initialed and dated.

7.1.1 Sample Container Labels

Waterproof, gummed labels generated from the SAP database will display information such as the unique sample ID number, the name of the project, sample location, and analysis type. Labels will be completed and placed on the containers in the field before collecting the sample. Information necessary for label completion will include sample date, time, preservative used, field measurements of hazards, and the sampler's initials.

7.1.2 Field Guidance Forms

Field guidance forms verifying unique sample numbers provided for each sample location will be generated from the SAP database. These forms will contain the following information:

- Media
- Sample ID numbers
- Sample location
- Aliquot ID
- Analysis type
- Container size and type
- Sample preservation.

7.1.3 Field Logbooks

Field logbooks will be used to record information necessary to interpret the analytical data in accordance with ARDC format, and controlled and managed according to LMITCO MCP-231, "Logbooks" (LMITCO 1996c).

7.1.3.1 Sample Logbooks. Sample logbooks will be used by the field teams. Each sample logbook will contain information such as:

- Physical measurements (if applicable)
- All QC samples
- Shipping information (collection dates, shipping dates, cooler ID number, destination, COC number, name of shipper).

7.1.3.2 Sample Field Team Leader's Daily Logbook. A project logbook maintained by the sample FTL will contain a daily summary of:

- All field team activities
- Problems encountered
- Visitor log
- List of site contacts.

This logbook will be signed and dated at the end of each day's sampling activities.

7.1.3.3 Field Instrument Calibration/Standardization Logbook. A logbook containing records of calibration data will be maintained for each piece of equipment requiring periodic calibration or standardization. This logbook will contain logsheets to record the date, time, method of calibration, and instrument ID number.

7.2 Sample Handling

Analytical samples for laboratory analyses will be collected in precleaned bottles and packaged according to the American Society for Testing and Materials, or EPA-recommended procedures. The QA samples will be included to satisfy the QA/QC requirements for the field operation as outlined in the QAPjP. Qualified (SMO approved) analytical and testing laboratories will analyze the samples.

7.2.1 Sample Preservation

Preservation of soil samples will be performed immediately upon sample collection. All soil, rinsate, and QA/QC samples will be placed in coolers containing frozen, reusable ice immediately after sample collection in the field. Samples will be maintained at 4°C for preservation immediately after sample collection through sample shipment as required.

7.2.2 Chain of Custody Procedures

The COC procedures will be followed per LMITCO MCP-244, "Chain of Custody, Sample Handling and Packaging" (LMITCO 1997d) and the QAPjP. Sample containers will be stored in a secured area accessible only to the field team members.

7.2.3 Transportation of Samples

Samples will be shipped in accordance with the regulations issued by the DOT (49 CFR Parts 171 through 178) and EPA sample handling, packaging and shipping methods (40 CFR 261.c.3c.3). Samples will be packaged in accordance with the requirements set forth in LMITCO MCP-244 (LMITCO 1997d).

7.2.3.1 Custody Seals. Custody seals will be placed on all shipping containers in such a way as to ensure that sample integrity is not compromised by tampering or unauthorized opening. Clear, plastic tape will be placed over the seals to ensure that the seals are not damaged during shipment.

7.2.3.2 On-site and Off-site Shipping. An on-site shipment is any transfer of material within the perimeter of the INEEL. Site-specific requirements for transporting samples within INEEL boundaries and those required by the shipping/receiving department will be followed. Shipment within the INEEL boundaries will conform to DOT requirements as stated in 49 CFR. Off-site sample shipment will be coordinated with LMITCO Packaging and Transportation personnel, as necessary, and will conform to all applicable DOT requirements.

7.3 Document Revision Requests

Revisions to this document will follow LMITCO MCP-230, "Environmental Restoration Document Control Center Interface" (LMITCO 1996d).

8. REFERENCES

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Wilkening, M., Facsimile to D. Kuhns, June 1998.

Appendix A

Sampling and Analysis Plan Tables

Plan Table Number: DOE/ID-10635-VT
SAP Number: DOE/ID-10635
Date: 06/18/98 Plan Table Revision: 3.0

SAMPLING AND ANALYSIS PLAN TABLE FOR CHEMICAL AND RADIOLOGICAL ANALYSIS

Project: WAG-1 SAMPLING (V-TANKS)

Project Manager: C. S. BLACKMORE SMO Contact: D.GRIGG

SAMPLE DESCRIPTION						SAMPLE LOCATION				ENTER ANALYSIS TYPES (AT) AND QUANTITY REQUESTED																			
SAMPLING ACTIVITY	SAMPLE TYPE	MEDIA	COLL TYPE	SAMPLING METHOD	PLANNED DATE	AREA	LOCATION	TYPE OF LOCATION	DEPTH (ft)	AT1 6T	AT2 8M	AT3 PC	AT4 PR	AT5 TI	AT6 TV	AT7 VA	AT8	AT9	AT10	AT11	AT12	AT13	AT14	AT15	AT16	AT17	AT18	AT19	AT20
1WG001	QC	WATER	RNST		06/15/98	TAN V-TANKS	QC	RINSATE	N/A			1		1		1													
1WG002	REG	SOIL	GRAB		06/15/98	TAN V-TANKS	A7	GRID	1-3			1		1	1	1													
1WG003	REG	SOIL	GRAB		06/15/98	TAN V-TANKS	B5	GRID	1-3			1		1	1	1													
1WG004	REG	SOIL	GRAB		06/15/98	TAN V-TANKS	C11	GRID	1-3			1		1	1	1													
1WG005	REG/QC	SOIL	DUP		06/15/98	TAN V-TANKS	D6	GRID	1-3			2		2	2	2													
1WG006	REG	SOIL	GRAB		06/15/98	TAN V-TANKS	A7	GRID	5-7			1		1	1	1													
1WG007	REG	SOIL	GRAB		06/15/98	TAN V-TANKS	B5	GRID	5-7			1		1	1	1													
1WG008	REG	SOIL	GRAB		06/15/98	TAN V-TANKS	C11	GRID	5-7			1		1	1	1													
1WG009	REG	SOIL	GRAB		06/15/98	TAN V-TANKS	D6	GRID	5-7			1		1	1	1													
1WG010	REG	SOIL	GRAB		06/15/98	TAN V-TANKS	A7	GRID	8-10			1		1	1	1													
1WG011	REG	SOIL	GRAB		06/15/98	TAN V-TANKS	B5	GRID	8-10			1		1	1	1													
1WG012	REG	SOIL	GRAB		06/15/98	TAN V-TANKS	C11	GRID	8-10			1		1	1	1													
1WG013	REG	SOIL	GRAB		06/15/98	TAN V-TANKS	D6	GRID	8-10			1		1	1	1													
1WG014	REG/QC	SOIL	DUP		06/15/98	TAN V-TANKS	D6	GRID	10-12	2	2		2																
1WG015	REG	SOIL	GRAB		06/15/98	TAN V-TANKS	D6	GRID	14-16	1	1		1																

The sampling activity displayed on this table represents the first six characters of the sample identification number.
The complete sample identification number (10 characters) will appear on field guidance forms and sample labels.

AT1: Total Carbon/Inorganic Carbonate
AT2: Metals by ICP/MS and ICP/AES
AT3: PCBs
AT4: Physical Properties
AT5: TCLP Metals
AT6: TCLP Volatiles
AT7: VOCs (TCL)
AT8:
AT9:
AT10:

AT11:
AT12:
AT13:
AT14:
AT15:
AT16:
AT17:
AT18:
AT19:
AT20:

COMMENTS

VOC (TCL) = methylene chloride, 1,1,1-trichloroethane, carbon tetrachloride, trichloroethene, tetrachloroethene.

PCB (TCL) = Aroclor-1254, Aroclor-1260.

Physical Properties (PR) = Soil Moisture, Bulk Density, and Particle Size Distribution

Metals = Si, Na, K, Ca, Fe, Al, Cr, Mg, Mn, P, and Ti by Atomic Emission Spectroscopy and Cs, Sr, and U by Mass Spectroscopy.

Plan Table Number: DOE/ID-10635-VT
SAP Number: DOE/ID-10635
Date: 06/18/98 Plan Table Revision: 3.0

SAMPLING AND ANALYSIS PLAN TABLE FOR CHEMICAL AND RADIOLOGICAL ANALYSIS

Project: WAG-1 SAMPLING (V-TANKS)

Project Manager: C. S. BLACKMORE SMO Contact: D.GRIGG

SAMPLE DESCRIPTION						SAMPLE LOCATION				ENTER ANALYSIS TYPES (AT) AND QUANTITY REQUESTED																			
										AT1	AT2	AT3	AT4	AT5	AT6	AT7	AT8	AT9	AT10	AT11	AT12	AT13	AT14	AT15	AT16	AT17	AT18	AT19	AT20
SAMPLING ACTIVITY	SAMPLE TYPE	MEDIA	COLL TYPE	SAMPLING METHOD	PLANNED DATE	AREA	LOCATION	TYPE OF LOCATION	DEPTH (ft)	6T	8M	PC	PR	TI	TV	VA													
1WG016	REG	SOIL	GRAB		06/15/98	TAN V-TANKS	D6	GRID	18-20	1	1		1																
1WG017	QC	WATER	RNST		06/15/98	TAN V-TANKS	QC	RINSATE	N/A			1		1		1													

The sampling activity displayed on this table represents the first six characters of the sample identification number.
The complete sample identification number (10 characters) will appear on field guidance forms and sample labels.

AT1: Total Carbon/Inorganic Carbonate
AT2: Metals by ICP/MS and ICP/AES
AT3: PCBs
AT4: Physical Properties
AT5: TCLP Metals
AT6: TCLP Volatiles
AT7: VOCs (TCL)
AT8:
AT9:
AT10:

AT11:
AT12:
AT13:
AT14:
AT15:
AT16:
AT17:
AT18:
AT19:
AT20:

COMMENTS

VOC (TCL) = methylene chloride, 1,1,1-trichloroethane, carbon tetrachloride, trichloroethene, tetrachloroethene.

PCB (TCL) = Aroclor-1254, Aroclor-1260.

Physical Properties (PR) = Soil Moisture, Bulk Density, and Particle Size Distribution

Metals = Si, Na, K, Ca, Fe, Al, Cr, Mg, Mn, P, and Ti by Atomic Emission Spectroscopy and Cs, Sr, and U by Mass Spectroscopy.

Plan Table Number: DOE/ID-10635-26 SAMPLING AND ANALYSIS PLAN TABLE FOR CHEMICAL AND RADIOLOGICAL ANALYSIS

SAP Number: DOE/ID-10635

Date: 06/18/98 Plan Table Revision: 3.0 Project: WAG-1 SAMPLING (TSF-26) Project Manager: C. S. BLACKMORE SMO Contact: D.GRIGG

SAMPLE DESCRIPTION						SAMPLE LOCATION				ENTER ANALYSIS TYPES (AT) AND QUANTITY REQUESTED																			
										AT1	AT2	AT3	AT4	AT5	AT6	AT7	AT8	AT9	AT10	AT11	AT12	AT13	AT14	AT15	AT16	AT17	AT18	AT19	AT20
SAMPLING ACTIVITY	SAMPLE TYPE	MEDIA	COLL TYPE	SAMPLING METHOD	PLANNED DATE	AREA	LOCATION	TYPE OF LOCATION	DEPTH (ft)	PC	TI	TV	VA																
1WG021	QC	WATER	RNST		06/15/98	TSF-26	QC	RINSATE	N/A	1	1		1																
1WG022	REG	SOIL	GRAB		06/15/98	TSF-26	C3	GRID	1-3	1	1	1	1																
1WG023	REG	SOIL	GRAB		06/15/98	TSF-26	C4	GRID	1-3	1	1	1	1																
1WG024	REG	SOIL	GRAB		06/15/98	TSF-26	F2	GRID	1-3	1	1	1	1																
1WG025	REG	SOIL	GRAB		06/15/98	TSF-26	E3	GRID	1-3	1	1	1	1																
1WG026	REG	SOIL	GRAB		06/15/98	TSF-26	G2	GRID	1-3	1	1	1	1																
1WG027	REG/QC	SOIL	DUP		06/15/98	TSF-26	G3	GRID	1-3	2	2	2	2																
1WG028	REG	SOIL	GRAB		06/15/98	TSF-26	C3	GRID	5-7	1	1	1	1																
1WG029	REG	SOIL	GRAB		06/15/98	TSF-26	C4	GRID	5-7	1	1	1	1																
1WG030	REG	SOIL	GRAB		06/15/98	TSF-26	F2	GRID	5-7	1	1	1	1																
1WG031	REG	SOIL	GRAB		06/15/98	TSF-26	E3	GRID	5-7	1	1	1	1																
1WG032	REG	SOIL	GRAB		06/15/98	TSF-26	G2	GRID	5-7	1	1	1	1																
1WG033	REG	SOIL	GRAB		06/15/98	TSF-26	G3	GRID	5-7	1	1	1	1																
1WG034	REG	SOIL	GRAB		06/15/98	TSF-26	C3	GRID	8-10	1	1	1	1																
1WG035	REG	SOIL	GRAB		06/15/98	TSF-26	C4	GRID	8-10	1	1	1	1																

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The complete sample identification number (10 characters) will appear on field guidance forms and sample labels.

AT1: PCBs
AT2: TCLP Metals
AT3: TCLP Volatiles
AT4: VOCs (TCL)
AT5:
AT6:
AT7:
AT8:
AT9:
AT10:

AT11:
AT12:
AT13:
AT14:
AT15:
AT16:
AT17:
AT18:
AT19:
AT20:

COMMENTS

VOC (TCL) = methylene chloride, 1,1,1-trichloroethane, carbon tetrachloride, trichloroethene, tetrachloroethene.

PCB (TCL) = Aroclor-1254 and Aroclor-1260.

Plan Table Number: DOE/ID-10635-26
SAP Number: DOE/ID-10635
Date: 06/18/98 Plan Table Revision: 3.0

SAMPLING AND ANALYSIS PLAN TABLE FOR CHEMICAL AND RADIOLOGICAL ANALYSIS

Project: WAG-1 SAMPLING (TSF-26)

Project Manager: C. S. BLACKMORE SMO Contact: D.GRIGG

SAMPLE DESCRIPTION						SAMPLE LOCATION				ENTER ANALYSIS TYPES (AT) AND QUANTITY REQUESTED																			
										AT1	AT2	AT3	AT4	AT5	AT6	AT7	AT8	AT9	AT10	AT11	AT12	AT13	AT14	AT15	AT16	AT17	AT18	AT19	AT20
SAMPLING ACTIVITY	SAMPLE TYPE	MEDIA	COLL TYPE	SAMPLING METHOD	PLANNED DATE	AREA	LOCATION	TYPE OF LOCATION	DEPTH (ft)	PC	TI	TV	VA																
1WG036	REG	SOIL	GRAB		06/15/98	TSF-26	F2	GRID	8-10	1	1	1	1																
1WG037	REG	SOIL	GRAB		06/15/98	TSF-26	E3	GRID	8-10	1	1	1	1																
1WG038	REG	SOIL	GRAB		06/15/98	TSF-26	G2	GRID	8-10	1	1	1	1																
1WG039	REG	SOIL	GRAB		06/15/98	TSF-26	G3	GRID	8-10	1	1	1	1																
1WG040	QC	WATER	RNST		06/15/98	TSF-26	QC	RINSATE	N/A	1	1		1																

The sampling activity displayed on this table represents the first six characters of the sample identification number.
The complete sample identification number (10 characters) will appear on field guidance forms and sample labels.

AT1: PCBs
AT2: TCLP Metals
AT3: TCLP Volatiles
AT4: VOCs (TCL)
AT5:
AT6:
AT7:
AT8:
AT9:
AT10:

AT11:
AT12:
AT13:
AT14:
AT15:
AT16:
AT17:
AT18:
AT19:
AT20:

COMMENTS

VOC (TCL) = methylene chloride, 1,1,1-trichloroethane, carbon tetrachloride, trichloroethene, tetrachloroethene.

PCB (TCL) = Aroclor-1254 and Aroclor-1260.